REMARKS

Claims 1-16, 22, 24, and 25 were pending, of which Claims 9-16 were indicated as being allowable. Claims 1-8, 22 and 25 were rejected. Claims 4, 5, and 22 have been amended and new Claim 26 has been added, support for which can be found, e.g., Fig. 1, paragraphs [0044]. No new matter is added.

Claim Rejections – 35 U.S.C. §112

Claims 4-6, 22 and 25 were rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 have been amended to make explicit what was implicit in the originally filed claim, i.e., that the second pattern is at the de-skew site on the second wafer layer. Claim 22 has been similarly amended. Reconsideration is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 1 and 24 were rejected under 35 U.S.C. §102(b) as being anticipated by Hennessey et al. (5,696,835) ("Hennessey"). Applicant requests reconsideration.

The Examiner construes the term "de-skewing" as encompassing any process that corrects the offset in the coordinates of a location on a wafer that has been loaded onto a stage." Based on this construction, Hennessey does not perform de-skewing in Figures 9-12.

The Examiner has provided two examples of "de-skewing", where the second example is based on Hennessey's Figures 9-12. Applicant respectfully disagrees with the Examiner's second example of "de-skewing" which he described as a "process that aligns individual wafer layers to each other; that is corresponding fixed coordinate locations of subsequent wafer layers may be offset (i.e., misaligned) from previous ones, so in order to compensate for such an offset, it is desirable to 'de-skew' the wafer for those layer." The Examiner's second example is based on an offset between two locations on a wafer, i.e., "coordinate locations of subsequent wafer layers". As construed by the Examiner, however, "de-skewing" is a process "that corrects the offset in the coordinates of a location on a wafer". Thus, de-skewing is not correcting for an offset of "locations of subsequent wafer layers" as described in the Examiner's second example.

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-5-   Serial No. 09/974,721

Moreover, Applicant points out that layers on a wafer have a fixed relationship with respect to each other. In other words, one layer cannot be moved with respect to another layer on a wafer.[1] Accordingly, it is not possible to "correct[] the offset" between two layers that have already been deposited on a wafer. Applicant acknowledges that Hennessey states that the misregistration measurement may be fed-forward "so that before the fabrication of other wafers 38 of a given lot, the fabrication tool 37 may be adjusted to correct some or all of the misregistration." Col. 9, lines 40-45. Based on this, the Examiner stated in the second example, that "the wafer can be de-skewed so that subsequent wafer layers of the same lot can be formed in perfect alignment." Applicant points out, however, that correcting for misregistration for "other wafers 38 of a given lot" is not de-skewing based on the Examiner's construction of de-skewing. Correcting for misregistration for other wafers of a given lot is not the same as "correct[ing] the offset in the coordinates of a location on a wafer that has been loaded onto a stage." Thus, Hennessey's determination of the misalignment between wafer layers is not de-skewing based on the Examiner's construction.

To specifically address Claim 1: Claim 1 recites "a method of forming a recipe" that comprises "learning a first pattern", "saving the first pattern and its location in a recipe", "learning a second pattern" and "saving the second pattern in the same recipe". As is known in the art, and is described in the specification, e.g., at paragraphs [0007] and [0032], a "recipe" includes an image or pattern that is used by pattern recognition systems to locate a de-skew site.

The Examiner stated that "Hennessey is considered to disclose de-skew sites and saving the first and second patterns in a recipe for de-skewing wafers, as claimed". Applicant disagrees. As discussed above, Applicant submits that Hennessey's disclosure of determining the misregistration between two layers on a wafer is not a disclosure of "de-skew" sites.

Moreover, Hennessey does not teach or suggest "saving the first and second patterns in a recipe for de-skewing wafers". The Examiner cited Fig. 11 as disclosing "forming a recipe for de-skewing wafers". Fig. 11, however, is "one method of determining the misregistration". Col. 9, lines 53-54. Assuming arguendo that a method of determining the misregistration is the same as a method of de-skewing, with which Applicant disagrees as

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[1] While it may be possible to completely remove a layer and reprocess the wafer to deposit another layer in its place, this is not de-skewing the wafer, it is reprocessing the wafer to form a new layer.

-6-   Serial No. 09/974,721

discussed above, Fig. 11 of Hennessey would be a "method of de-skewing" and not a "method of forming a recipe for de-skewing wafers" as recited in Claim 1.

The Examiner cited step 174 in Fig. 11 as "learning a first pattern" and learning a second pattern", and step 176 in Fig. 11 as "saving the first pattern" and "saving the second pattern". In step 174 of Fig. 11, however, Hennessey states that "[t]he digital image is then converted to image primitives with first target primitives for the first target 158 and second target primitives for the second target 160". In step 176 Hennessey states "[t]he relative displacement between the first target 158 and the second target 160 is then determined by calculating the relative displacement of the first target primitives from the second target primitives in symbolic space. Thus, both steps 174 and 176 in Fig. 11 are related to the determination of the misregistration and are not a method of forming a recipe for de-skewing wafer, which is what is claimed in Claim 1.

Accordingly, Applicant respectfully submits that Claim 1 is patentable over Hennessey. Reconsideration and withdrawal of this rejection is respectfully requested. Claim 24 depends from Claim 1 and is therefore likewise patentable for at least the same reasons.

Claim 1 was also rejected under 35 U.S.C. §102(e) as being anticipated by Michael et al. (6,240,218) ("Michael"). Reconsideration is requested.

A brief discussion of de-skewing may be helpful to further the prosecution in this case. In order to de-skew a wafer, there are two processes that are undertaken. First, a recipe is formed, which will be referred to as process A. As discussed in the background section of the specification, a recipe is used by pattern recognition systems to locate a de-skew site. Conventionally, a different recipe is used for each specific layer of the wafer. Once process A is complete, i.e., the recipe for a wafer layer has been formed, the second process of actually de-skewing a wafer may be performed, which will be referred to as process B. De-skewing a wafer includes locating the de-skew site using the previously formed recipe, and calculating a transformation matrix based on the initial and the subsequent coordinates of the de-skew sites on the wafer.

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In the Response to Amendments and Arguments, the Examiner stated that "Michael's figure 14 is considered to be 'related' to forming a recipe for de-skewing wafers insofar as it

-7-   Serial No. 09/974,721

details the process of determining the 'relative displacement' between the 1-D template image (corresponding to the first pattern) and the 1-D feature image (corresponding to the second pattern)." The Examiner then stated that "Michael is considered to learn both a first and second pattern on different wafer layers. The first pattern corresponds to the pattern extracted from a 'good sample' via the process of figure 11 into a 1-D template image. The second pattern corresponds to the pattern extracted from a run-time sample via the process of figure 14 into a 1-D feature image." Applicant disagrees.

Fig. 14 of Michael is related to process B described above, i.e., the actual "de-skewing" of the wafer, referred to in Michael as the "run-time phase" in which "the translational and rotational alignment" is found. Col. 7, lines 34-38.

The Examiner is construing the term "recipe" as "method". For example, the Examiner stated "[s]uch relative displacement is subsequently incorporated into a 'recipe', or method, for de-skewing wafers". Applicant submits that the Examiner's interpretation is incorrect and is not consistent with the conventional use of the term within the art, and is not consistent with the specification, which describes a recipe as including an image or pattern that is used by pattern recognition systems to locate a de-skew site. See, e.g., paragraphs [0007] and [0032].

Interpreting the term "recipe" as "method" is functionally reading that term out of the claim. In other words, the Examiner appears to be reading Claim 1 as "a method of de-skewing wafers", which is not what is claimed. Moreover, to literally replace the term recipe with the Examiner's suggested interpretation would lead to Claim 1 stating "A method for forming a method of de-skewing wafers", which does not make sense.

Applicant notes that Fig. 11 of Michael is related to the "empirical training ... for creating a template image", i.e., which is the process A described above. Fig. 11, however, does not teach or suggest "learning a first pattern at a de-skew site on a first wafer layer" and "learning a second pattern at the de-skew site on a second wafer layer". In fact, Michael is merely the conventional process described in the background section of the present application in which one image is used for each specific layer of the wafer.

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Thus, Applicant respectfully submits that Claim 1 is patentable over Michael. Reconsideration and withdrawal of this rejection is respectfully requested.

-8-   Serial No. 09/974,721

Claim Rejections – 35 U.S.C. §103

     Claims 2, 3, and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Michael in view of Garakani et al. (6,240,208) ("Garakani"). Applicant respectfully traverses.

     Claims 2, 3, and 7 depend from Claim 1. Garakani fails to make up for the deficiencies of Michael. Accordingly, Claims 2, 3, and 7 are allowable for at least the same reasons as Claim 1.

     Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Michael in view of Weinzimmer et al. (6,681,151) ("Weinzimmer"). Applicant respectfully traverses.

     Claims 8 depends from Claim 1. Weinzimmer fails to make up for the deficiencies of Michael. Accordingly, Claim 8 is allowable for at least the same reasons as Claim 1.

     Claims 4, 5, and 22 have been amended and new Claim 26 has been added, leaving Claims 1-16 and 22-26 pending, of which Claims 9-16 were indicated as being allowable. For the above reasons, Applicant respectfully requests allowance of Claims 1-16 and 22-26. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8202.

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I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office to the fax number 571-273-8300 on August 3, 2006 .

Michael J. Halbert   **8-3-06**
Attorney for Applicant(s)   Date of Signature

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-9-   Serial No. 09/974,721